

Section 9-4: Multiply a Polynomial by a Monomial

By the end of this lesson, you should be able to answer:

- How do you multiply polynomials by monomials?

Where you might see this in the real world:

- Travel, part-time job, sports, finance, geography

In Section 9-2, we multiplied a monomial by a monomial. Then in Section 9-3, we used what we learned about multiplying by a monomial with dividing by a monomial by first splitting up a polynomial into its different terms. We are going to do the same thing when we multiply a polynomial by a monomial.

Example 1: Simplify.

a. $2x(2x + y)$

b. $-5w(-2w^2 + 4w)$

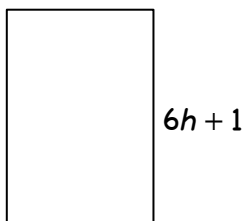
c. $-2n(3n^2 + 4n - 5)$

d. $5x^2y^2(2xy + 6y^3 + 3x^2y^2)$

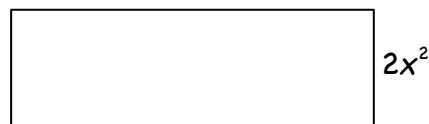
You should have noticed that all we are doing here is distribution. We need to distribute the number in front to everything inside the parentheses. When we have many terms, we can show the multiplication of the monomial that we are distributing as multiplication by each monomial. Once again, we are going to multiply the coefficients first, then the variables in alphabetical order.

Example 2: Write and simplify an expression for the area of each figure.

a. $4h$



b. $3x^2 + 2$



Problem Set:

"A candle loses none of its light by lighting another candle." - Unknown